CASE STUDY: ZEISS AT LISA tri toric IOL

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Meeting patient expectations for spectacle independence with the trifocal AT LISA tri toric intraocular lens

In this report we describe how we solved a specific patient demand for spectacle free near vision. The patient was particularly interested in a good visual performance at 20 – 25 cm distance. After refractive lens exchange for this relatively young patient with the trifocal AT LISA tri toric 939M/MP intraocular lens (IOL) the patient was very happy with the outcome.

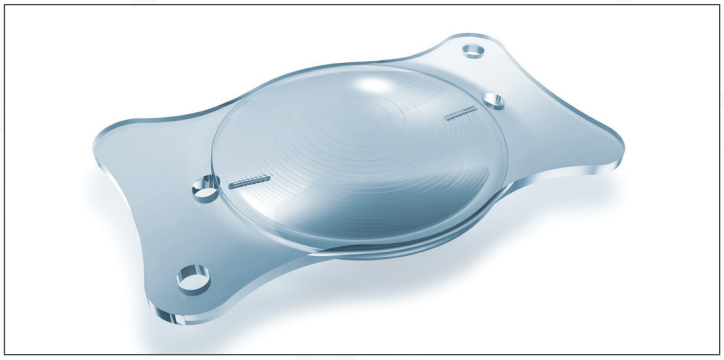

Fig. 1 – The AT LISA tri toric 939M/MP IOL

Introduction

Multifocal intraocular lenses (MIOLs) are designed to reduce spectacle dependence and improve quality of life after cataract or refractive lens surgery. Many studies show the significant improvement in uncorrected near visual acuity (UNVA) after the implantation of MIOLs compared to monofocal IOLs, without decreasing distance visual performance[1].

Trifocal diffractive multifocal designs have been shown to provide an effective intermediate visual restoration without degradation of distance and near vision[2-8]. Finally, the combination of the trifocal diffractive design of the AT LISA tri with a toric surface allows an integral visual restoration in patients with pre-existing corneal astigmatism undergoing lensectomy[9].

By adjusting the target refraction for each eye, the surgeon has the possibility to fine-tune the patient's visual performance at different distances to meet specific patient demands. This monovision approach is getting more and more popular as a method for customizing postoperative visual performance.

Case Report

A 35 year old female patient presented with hyperopia and astigmatism in both eyes. She expressed the wish to be spectacle free at all distances with a particularly good vision at 20-25 cm to be able to put on her make-up.

Her preoperative refraction and visual acuities are listed in table 1.

The patient was informed in depth about the possible advantages and drawbacks of a refractive lens exchange with monovision approach and confirmed her willingness for the surgery.

Parameter	OD	OS
Sphere (D)	+4.25	+4.25
Cylinder (D)	-4.75 x 175°	-4.5 x 177°
UDVA (decimal)	0.16	0.16
CDVA (decimal)	1.0	1.0

Table 1 – Preoperative refraction and visual acuity data (D diopter; UDVA uncorrected distance visual acuity; CDVA corrected distance visual acuity)

Target refractions were emmetropia for the dominant right eye and -0.75 D for the left eye. Uneventful refractive lens exchange surgery was performed with implantation of AT LISA tri toric 939MP IOLs with a spherical equivalent of 22.5 D and a torus of 5.5 D at an axis of 87° in the right eye and with a spherical equivalent of 23.5 D and a torus of 5.5 D at an axis of 93° in the left eye. Both IOLs were implanted through a 1.8 mm incision.

One year after surgery visual acuity and refraction were stable with the following results (table 2).

The patient was very happy with the outcome of the surgery and spectacle-free at all distances.

Parameter	OD	OS
Sphere (D)	0.0	-0.75
Cylinder (D)	-0.5 x 175°	0.0
SEQ (D)	-0.25	-0.75
Monocular visual acuity (decimal)		
CDVA	1.25	1.25
UDVA	1.0	0.63
UIVA (80 cm)	1.0	1.25
UIVA (60 cm)	0.63	1.0
UNVA (40 cm)	1.0	0.8
UNVA (25 cm)	0.63	1.25
Binocular visual acuity (decimal)		
CDVA	1.25	
UDVA	1.0	
UIVA (80 cm)	1.0	
UIVA (60 cm)	1.25	
UNVA (40 cm)	1.0	
UNVA (25 cm)	1.0	

Table 2 - Postoperative refraction and visual acuity data (D diopter; SEQ spherical equivalent; CDVA corrected distance visual acuity; UDVA uncorrected distance visual acuity; UIVA uncorrected intermediate vision; UNVA uncorrected near visual acuity)

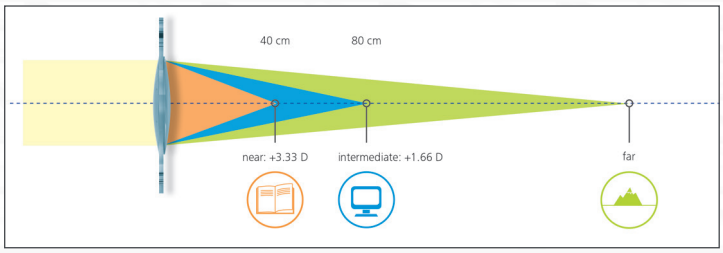

Fig. 2 – Near and intermediate additions of the AT LISA tri toric 939M/MP IOL

Discussion

The AT LISA tri and tri toric IOLs are designed for spectacle-free vision at far, intermediate and near distances.

The near addition of 3.33 D aims at a focal point at 40 cm distance and the intermediate addition of 1.66 D aims at a focus at 80 cm distance. Our case shows that fine-tuning the target refraction via the monovision approach enables the surgeon to design the preferred reading distance according to the patient's demand. With our chosen mini-monovision of 0.75 D, visual acuity (decimal) is 1.0 or even better at all distances. The patient has an excellent visual performance at the preferred distance of 25 cm - which is rather close - but doesn't need glasses for intermediate or distance visual tasks.

Conclusion

The mini-monovision approach with the intraocular lens AT LISA tri toric 939M/MP allows the surgeon to provide spectacle-free vision for his patients from very close (25 cm) to far distance, without compromising visual performance at intermediate distances.

References

1. Calladine D, Evans JR, Shah S, Leyland M. Multifocal versus monofocal intraocular lenses after cataract extraction. Cochrane Database Syst Rev 2012; 12:9:CD003169
2. Mojzis P, Peña-García P, Lieheneova I, Ziak P, Alió JL. Outcomes of a new diffractive trifocal intraocular lens. J Cataract Refract Surg 2014; 40: 60-9.
3. Law EM, Aggarwal RK, Kasaby H. Clinical outcomes with a new trifocal intraocular lens. Eur J Ophthalmol 2014; 24: 501-8.
4. Alió JL, Montalbán R, Peña-García P, Soria FA, Vega-Estrada A. Visual outcomes of a trifocal aspheric diffractive intraocular lens with microincision cataract surgery. J Refract Surg 2013; 29: 756-61.
5. Sheppard AL, Shah S, Bhatt U, Bhogal G, Wolffsohn JS. Visual outcomes and subjective experience after bilateral implantation of a new diffractive trifocal intraocular lens. J Cataract Refract Surg 2013; 39: 343-9.
6. Cochener B, Vryghem J, Rozot P, Lesieur G, Heireman S, Blanckaert JA, Van Acker E, Ghekiere S. Visual and refractive outcomes after implantation of a fully diffractive trifocal lens. Clin Ophthalmol 2012; 6: 1421-7.
7. Lesieur G. [Outcomes after implantation of a trifocal diffractive IOL]. J Fr Ophthalmol 2012; 35: 338-42.
8. Voskresenskaya A, Pozdeyeva N, Pashtaev N, Batkov Y, Treushnicov V, Cherednik V. Initial results of trifocal diffractive IOL implantation. Graefes Arch Clin Exp Ophthalmol 2010; 248: 1299-1306.
9. Kretz FT, Breyer D, Klabe K, Hagen P, Kaymak H, Koss MJ, Gerl M, Mueller M, Gerl RH, Auffarth GU. Clinical outcomes after implantation of a trifocal toric intraocular lens. J Refract Surg. 2015; 31: 504-10

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